



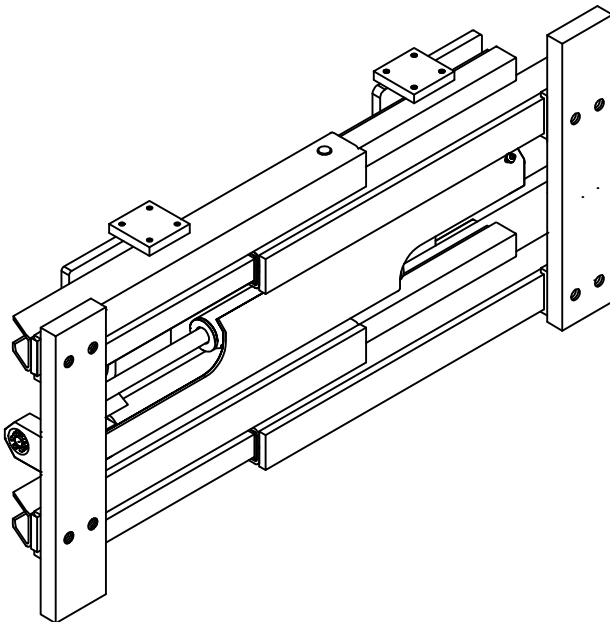
SERVICE MANUAL / PARTS LIST

BASIC CLAMP BOLT-ON ARMS

CONTENTS:

PAGE

- | | |
|-----|--|
| 1 | Lift Truck Requirements
General Installation Procedures
General Inspection |
| 2-3 | Basic Clamp Parts Group |
| 4 | Clamp Cylinder Assembly & Service |
| 5 | Valve Assembly |
| 6 | Adjusting Relief Pressure |
| 7 | Arm Slide & Shim Replacement |
| 8 | Troubleshooting Guide |



425 Hazel St.
Kelso WA 98626
(800) 248-6079
Fax (360) 578-9934

LIFT TRUCK REQUIREMENTS

CAPACITY

Capacity shown on the Clamp name plate is for the Clamp only. the combined truck and Clamp capacity is provided by the lift truck manufacturer.

CLAMP HYDRAULICS

Recommended Truck Pressure: 1700 to 2500 PSI (115 to 170 bar)

Oil volume: 6-10 GPM (22.5 to 38 l/min)

Hydraulic fluid: petroleum based hydraulic fluid only

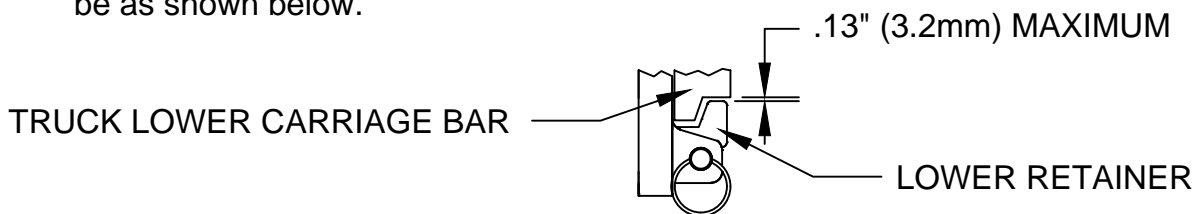
Hydraulic supply group: includes hoses and take-up - one set for each function

Auxiliary valve:

2 Function (Side Shift & Clamp) = a double auxiliary valve

GENERAL INSTALLATION PROCEDURES

1. Make sure that the attachment centering lug is completely seated in truck carriage center notch.
2. Clearance between the lower retainers that hold the attachment to the truck lower carriage bar should be as shown below.



3. Attach truck supply group (take-up) to clamp valve on attachment base.
4. Standing clear of the Clamp attachment cycle the attachment in and out several times. Use caution because partially filled hydraulic lines may cause erratic movement.

GENERAL INSPECTION AND MAINTENANCE

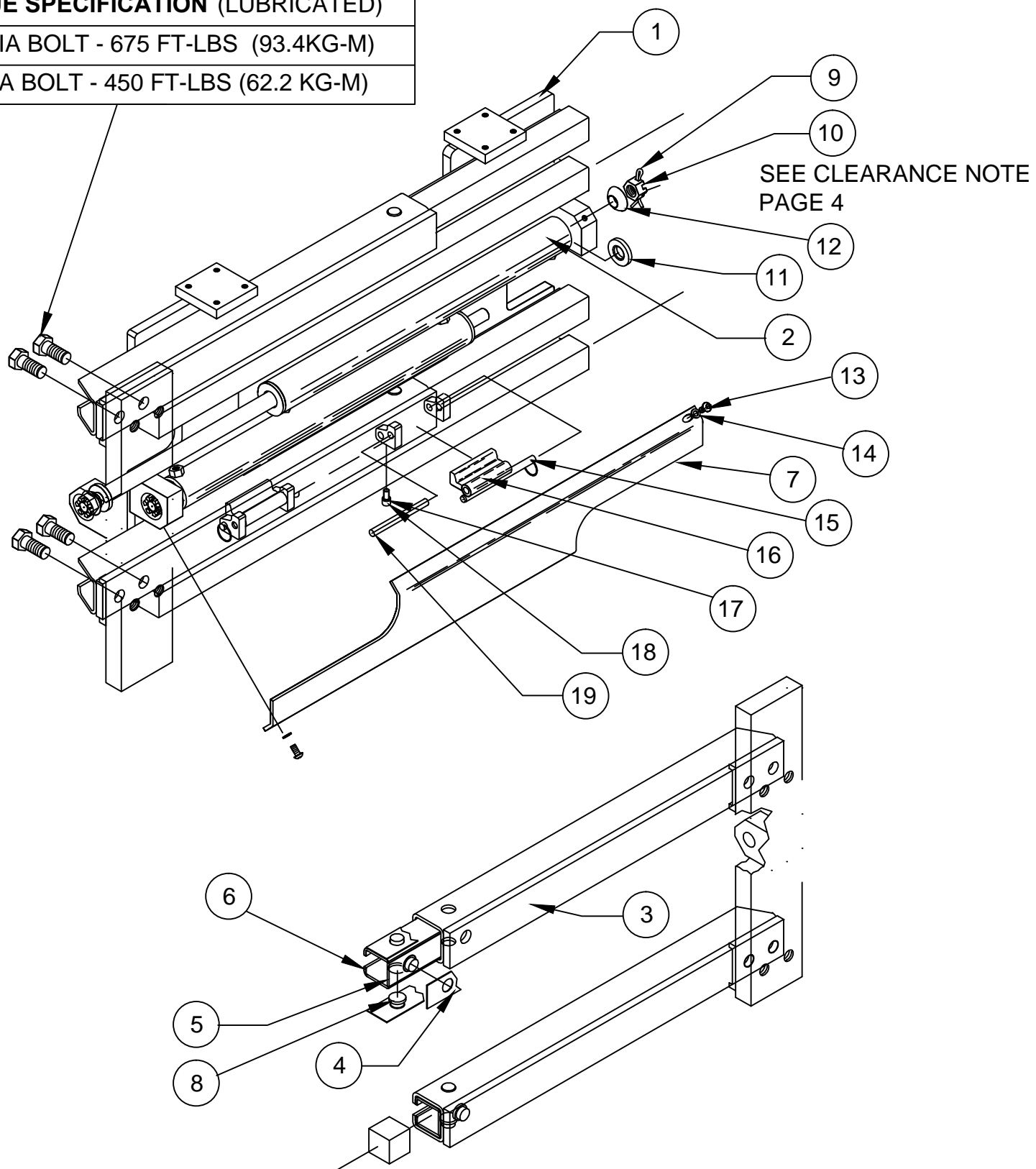
1. Check all hydraulic fittings, hoses, cylinders and valves for leakages - repair or replace as required
2. Check hoses for pinch points and signs of wear. Replace worn hoses with LORON hose or Parker Parflex # 560 wire - reinforced hose only.
3. All bolts should be checked and tightened as required. See Torque Note page 2.
4. Check lower retainer clearance - see item 2 in General Installation Procedures above. A shim may be tack-welded to the bottom of the lower retainers to tighten the clearance if necessary.

BASIC CLAMP PARTS GROUP - 1

TORQUE SPECIFICATION (LUBRICATED)

1.00" DIA BOLT - 675 FT-LBS (93.4KG-M)

.88" DIA BOLT - 450 FT-LBS (62.2 KG-M)



BASIC CLAMP PARTS GROUP - 2

L20 & L25 CLAMPS

#	QTY	PART #	DESCRIPTION
1	1	SEE CUSTOMER PACKET	FRAME WELDMENT
2	2	SEE CUSTOMER PACKET	CYLINDER ASSEMBLY
3	4	SEE CUSTOMER PACKET	ARM WELDMENT
4	8	SEE CUSTOMER PACKET	SHIM
5	4	SEE CUSTOMER PACKET	FLAT SLIDE
6	8	SEE CUSTOMER PACKET	ANGLE SLIDE
7	1	SEE CUSTOMER PACKET	FRONT COVER
8	12	103752	SLIDE BUTTON

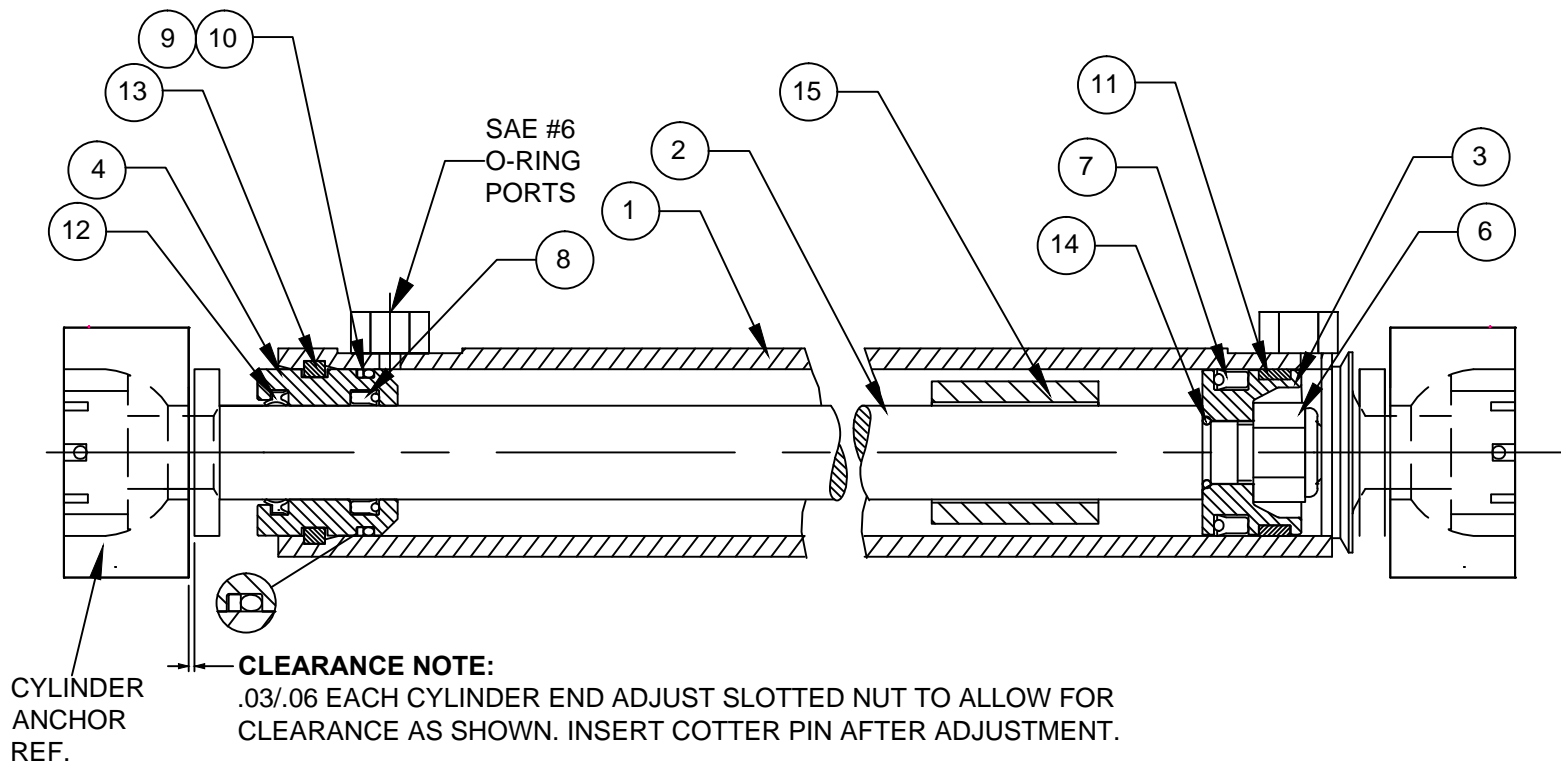
L35 & L50 CLAMPS

#	QTY	PART #	DESCRIPTION
1	1	SEE CUSTOMER PACKET	FRAME WELDMENT
2	2	SEE CUSTOMER PACKET	CYLINDER ASSEMBLY
3	4	SEE CUSTOMER PACKET	ARM WELDMENT
4	8	SEE CUSTOMER PACKET	SHIM
5	4	SEE CUSTOMER PACKET	FLAT SLIDE
6	8	SEE CUSTOMER PACKET	ANGLE SLIDE
7	1	SEE CUSTOMER PACKET	FRONT COVER
8	12	107997	SLIDE BUTTON

L20 - L50 CLAMPS - COMMON PARTS

#	QTY	PART #	DESCRIPTION
9	4	100574.86	COTTER PIN
10	4	101333	SLOTTED NUT
11	4	100047	HARDENED WASHER
12	4	101324	SPHERICAL BEARING
13	2	1C.0612	HEX HEAD BOLT
14	2	4E.06	LOCK WASHER
15	2	100572.060	BALL-LOCK PIN
16	2	101098	LOWER RETAINER
17	2	16E.06	LOCK WASHER
18	2	11G.0612	SOCKETHEAD BOLT
19	2	100077.3	ROUND BAR

CYLINDER ASSEMBLY



L35 & L50 CLAMP CYLINDER

#	QTY	PART #	DESCRIPTION
	1	CONSULT FACTORY	CYLINDER ASSEMBLY
1	1	CONSULT FACTORY	TUBE
2	1	CONSULT FACTORY	ROD
3	1	100021	PISTON
4	1	100020	GLAND
5	1	101036	SEAL KIT (NOT SHOWN)
6	1	101035	MODIFIED ESNA NUT
7	1	100032.107	POLY PAK LSP
8	1	100031.059	POLY PAK LSP
9	1	100028.316	BACK-UP O-RING
10	1	100029.316	O-RING LSP
11	1	100033	WEAR RING LSP
12	1	101034.6	WIPER LSP
13	1	100027.1	LOCKWIRE
14	1	100029.203	O-RING LSP
15	1	CONSULT FACTORY	SPACER

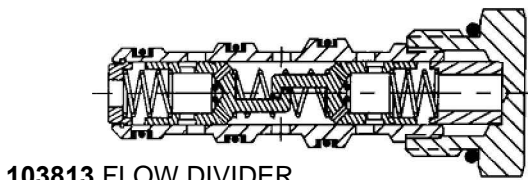
L20 & L25 CLAMP CYLINDER

#	QTY	PART #	DESCRIPTION
	1	CONSULT FACTORY	CYLINDER ASSEMBLY
1	1	CONSULT FACTORY	TUBE
2	1	CONSULT FACTORY	ROD
3	1	101256	PISTON
4	1	101254	GLAND
5	1	101261	SEAL KIT (NOT SHOWN)
6	1	101035	MODIFIED ESNA NUT
7	1	100032.095	POLY PAK LSP
8	1	100031.059	POLY PAK LSP
9	1	100028.314	BACK-UP O-RING
10	1	100029.314	O-RING LSP
11	1	101260	WEAR RING LSP
12	1	101034.6	WIPER LSP
13	1	100027.2	LOCKWIRE
14	1	100029.203	O-RING LSP
15	1	CONSULT FACTORY	SPACER

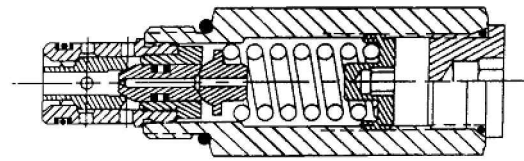
CYLINDER SERVICE

- Prior to assembly lubricate seals, cylinder bore and rod with STP.
- Inspect all parts for scratches, nicks and gouges- -replace all damaged components.
- Inspect cylinder bore and rod for scoring- -replace if scored
- Avoid damage to seal grooves- -use a dull screwdriver for seal removal
- Torque piston nut to 200 FT/LBS.

SIDE SHIFTING VALVE



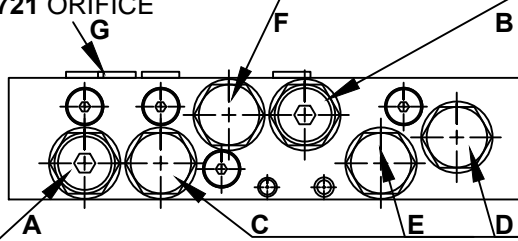
103813 FLOW DIVIDER
TORQUE 10-12 FT/BLS
104711 SEAL KIT



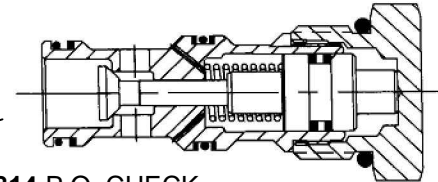
103815 BIDIRECTIONAL RELIEF
TOQUE TO 35/40 FT/LBS
104716 SEAL KIT

104721 ORIFICE

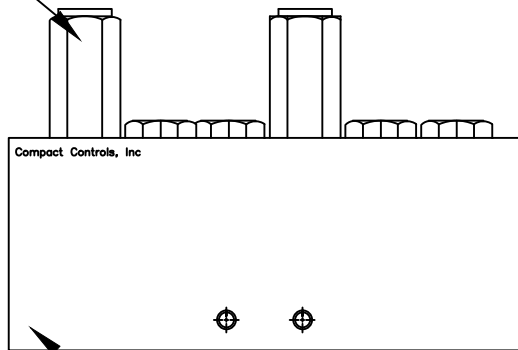
101419.03 #4 SAE
O-RING PLUGS



103815.1 BIDIRECTIONAL RELIEF
SEE 103815 ABOVE FOR SEAL KIT AND TORQUE NOTE



103814 P.O. CHECK
TORQUE 35/40 FT/LBS
104715 SEAL KIT

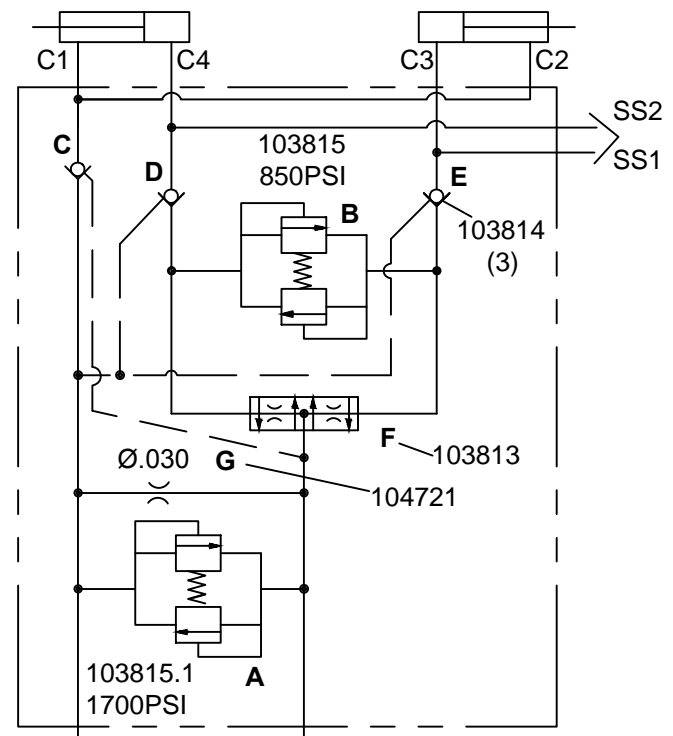


100011 SIDE SHIFTING VALVE ASSEMBLY
(Includes all cartridges & plugs)

NOTE:

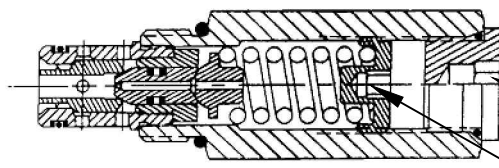
1. Lubricate threads & seals prior to assembly.
2. For VALVE pressure changes See page 7.

HYDRAULIC SCHEMATIC



QTY	PART #	DESCRIPTION
1	103815	RELIEF CARRIAGE
1	103813	FLOW DIVIDER / COMBINER
3	103814	P.O. CHECK CARTRIDGES
1	103815.1	RELIEF CARTRIDGE
14	101419.03	#4 SAE O-RING PLUG LSP
1	104721	ORIFICE

ADJUSTING RELIEF PRESSURE



WARNING:

RELEASE TRUCK PRESSURE PRIOR TO SERVICING VALVE BY TURNING THE TRUCK OFF AND "WORKING" THE SIDE SHIFT AND CLAMP FUNCTION CONTROLS

REMOVE CAP - REPLACE CAP PRIOR TO PRESSURIZING SYSTEM

TURN ADJUSTMENT:
COUNTERCLOCKWISE TO DECREASE PRESSURE
CLOCKWISE TO INCREASE PRESSURE

DO NOT EXCEED 2000 PSI (136 BAR)

ADJUSTING SYSTEM PRESSURE

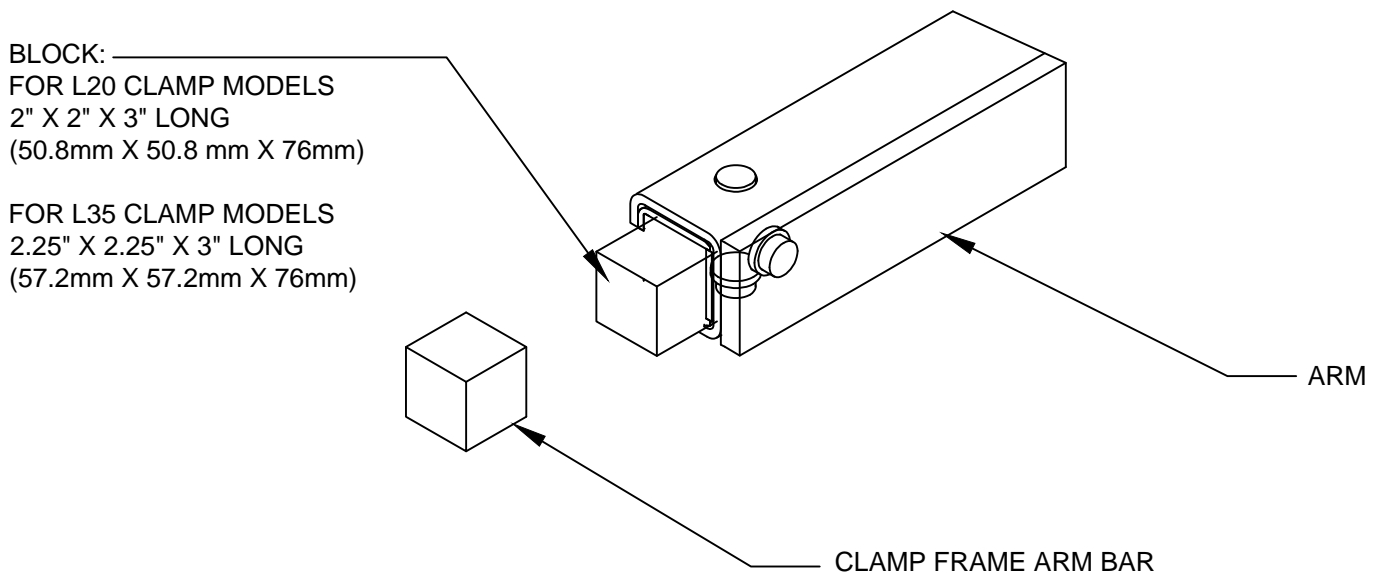
1. Release system pressure prior to servicing valve by turning the truck off and working the side shift and clamp function controls several times.
2. Prior to adjusting system pressure, disconnect the hoses from the clamp valve at the "open" and "close" ports. Install a separate in-line tee with a short hose and a pressure gauge that is calibrated to 5000 psi (340 bar) in each port (two required). Reconnect hoses.
3. Measure system pressure by securely clamping a load or close the clamp arms all the way and hold the control and hold the control lever in the closed (clamped) position. The actual clamping pressure is the difference between the pressure shown on the gauge in the "open" port subtracted from the pressure shown on the "close" port gauge.
4. Release system pressure (see step 1). Remove cap on bidirectional valve (item #4 on side shifting valve) and adjust cartridge no more than one quarter turn. Replace cap prior to pressurizing system. Repeat until desired pressure setting is achieved. Do not exceed 2000 psi (136 bar) clamping pressure.

ADJUSTING BY-PASS PRESSURE

1. If on arm bottoms out and the other moves more than 3" (76mm) before opening fully, increase by-pass relief pressure. If one arm bottoms out and the other does not open fully, decrease by-pass pressure.
2. To adjust by-pass relief pressure, release system pressure prior to servicing valve by turning the truck off and working the side shift and clamp function control several times.
3. Remove cap on bidirectional valve (item #1 on side shifting valve) and adjust cartridge no more than one quarter turn. Replace cap prior to pressurizing system. Repeat until desired pressure setting is achieved. Do not exceed 2000 psi (136 bar)

ARM SLIDE & SHIM REPLACEMENT

1. To replace the slides extend the arms to the fully open position. Release system pressure prior to removing the arms by turning the truck off and working the side shift and clamp function controls several times.
2. Support the arm with an overhead crane or lift truck. Be sure to secure the chain or sling in a manner that prevents the arm from falling out of the chain or sling when hanging free of the clamp frame.
3. Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, carefully slide the clamp arm off of the clamp frame.
4. Install the arm on the clamp frame ensuring that the arm moves freely without excessive binding. If the arm is too loose or too tight add or remove shims as required. Once the clearance is satisfactory insert the cylinder rod into the cylinder anchor on the arm. Install the spherical bearing, nut and cotter pin onto the cylinder rod end. Be sure to leave .03" - .06" (.7mm to 1.5mm) clearance to allow the cylinder to "float" on it's mountings (see page 4). Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, carefully slide the clamp arm off of the clamp frame.



5. Inspect slides and slide buttons for wear. Slides may be rotated end-for-end and re-used if excessively worn on the outer end only. Extra shims may be used to tighten operating clearance on slightly worn slides. Replace any slides worn to less than .06" (1.5mm) thick or any slide that is deeply scored or broken.
6. To aid in replacing the slides a block may be fashioned of wood or another convenient material to the dimensions shown above. The block is inserted in the end of the arm to hold the slides, shims and buttons in position while the arm is inserted over the arm bars on the clamp frame. The block is expelled out the opposite end of the arm as the arm is pushed onto the frame.
7. Prior to installing the arm the block may be used to determine the number of shims to place under the slides. Adjust the clearance between the slides and the block to provide approximately .06" (1.5mm) running clearance between the slides and arm when installed.

TROUBLE SHOOTING GUIDE

LOADS SLIPPING OR DROPPING

POSSIBLE CAUSES

1. Valve cartridges not sufficiently tight
2. System relief pressure set too low
3. Internal leakage in cylinder
4. Incorrect clamp pad size or load not fully engaged in clamp arms
5. Pad camber set incorrectly
6. Load too heavy for clamp capacity
7. Load may not be stacked correctly or may need to be unitized
8. Bent arms or contact pads

SOLUTIONS

1. Tighten all cartridges to torque values shown on page 6
2. See Adjusting System Pressure page 7
3. Replace Cylinder seals. If tube, piston or rod scored replace with new parts.
4. Be sure the clamp pads are correctly sized and the load for the load and the load is positioned fully in the clamp arms
5. Shim pads to change camber
6. Consult factory
7. Re-stack or unitize load (shrink wrap)
8. Consult factory

CRUSHING LOADS

POSSIBLE CAUSES

1. System relief pressure set too high
2. Operator over-working (milking) control valve
3. Bent arms or contact pads
4. Pad camber set incorrectly
5. Variable loads that require different clamping pressures

SOLUTIONS

1. See Adjusting System Pressure page 7
2. Once the pad contacts the load, clamp the load in one even motion - do not over-work the valve
3. Consult factory
4. Shim pads to change camber
5. Install a 4-position pressure regulator on truck cowl - consult factory for part number and availability